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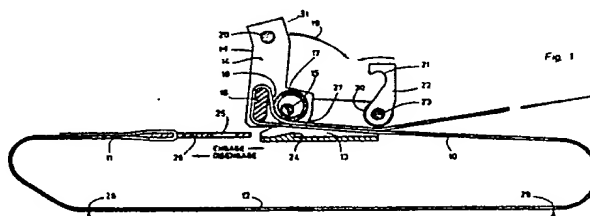
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54 Improvements in or relating to buckles or securing straps.

57 The present invention provides a locking buckle for securing one end (10) of a flexible strap, comprising a body member (13), a handle member (14) pivotally mounted on the body member for movement between a released position and a secured position, a cross-bar (16) fixedly mounted on the handle member at a point eccentric to the point of pivoting of the handle member on the body member and a locking member (17) movably mounted on the handle member to form a nip (18) between it and the cross-bar, the arrangement being such that with the handle member in the released position an end of a flexible strap may be looped around the cross-bar with a single thickness of strap passing through said nip and with a double thickness lying against the locking member and so that on movement of the handle member to the secured position, the strap is tensioned by the eccentric movement of the cross-bar and the tension in the double thickness of the strap urges the locking member to close said nip and grip the single thickness of the strap against the locking bar.



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IMPROVEMENTS IN OR RELATING TO BUCKLES OR SECURING STRAPS

This invention relates to a buckle such as may be used to secure the end of a flexible strap to some item, or to secure two ends of flexible straps together. The invention may be applied to straps used for any securing purpose but is particularly, but not exclusively, concerned with securing straps which may be used to hold items of cargo on a vehicle or other means of transport, or on a pallet for use in transporting the item.

It is an object of the present invention to provide such a buckle which is convenient in use and which will tension the strap on closing the buckle.

Accordingly the present invention provides a locking buckle for securing one end of a flexible strap, comprising a body member, a handle member pivotally mounted on the body member for movement between a released position and a secured position, a cross-bar fixedly mounted on the handle member at a point eccentric to the point of pivoting of the handle member on the body member and a locking member movably mounted on the handle member to form a nip between it and the cross-bar, the arrangement being such that with the handle member in the released position an end of a flexible strap may be looped around the cross-bar with a single thickness of strap passing through said nip and with a double thickness lying against the locking member and so that on movement of the handle member to the secured position the strap is tensioned by the eccentric movement of the cross-bar and the tension in the double thickness of the strap urges the locking member to close said nip and grip the single thickness of the strap against the locking bar.

Preferably said body member is formed with an abutment over which a latch plate attached to a second end of the strap may be hooked.

Preferably said handle member is formed with a cam surface arranged to hold the latch plate on said abutment when the handle is in said secured position while allowing removal of the latch plate from the abutment when the handle member is in said released position.

Preferably said cross-bar is of generally rectangular cross-section with rounded edges, said nip lying along a longer face of the cross-section.

Preferably said locking member is in the form of a roller.

Preferably said roller is in the form of a tube loosely positioned over a pivot shaft so as to be movably mounted on the handle member.

An embodiment will now be described, by way of example only, with reference to the accompanying drawings in which:

FIGURE 1 shows a schematic side view of

an embodiment of the invention in a released position,

FIGURE 2 shows the embodiment of Figure 1 in a secured position,

FIGURE 3 shows a plan view of the embodiment of Figure 1, with the strap omitted,

FIGURE 4 shows a side view from the right of the embodiment of Figure 1 with the strap omitted, and

FIGURE 5 shows a side view from the left of the embodiment of Figure 1 with the strap omitted.

Figure 1 shows in schematic side cross-section a buckle arranged to secure the ends 10 and 11 of a flexible strap 12, to one another.

The buckle comprises a body member 13 comprising a base and two side plates 13A, 13B on which a handle member 14 is pivotally mounted by means of a pivot shaft 15. The handle member is in the form of two side plates, one only of which is shown in the drawings, with the pivot shaft 15 extending between them and on either side of the handle member to be supported in the side plates 13A, 13B of the body member 13. A cross-bar 16 which is of generally rectangular cross-section with rounded edges also extends between the side plates 14A, 14B of the handle member 14, as does a locking member 17 in the form of a tube loosely positioned on the pivot shaft 15 so as to be movably mounted on the handle member. A nip indicated generally at 18 is formed between the locking member 17 and the cross-bar 16.

In order to secure the end 10 of the flexible strap to the body 13, and thus any item to which the body 13 may be secured, the end 10 is looped round the cross-bar 16 with a single thickness passing through the nip 18 and with a double thickness lying against the locking member 17. Thus when the handle member 14 is pivoted in the direction of the arrow 19 from the released position shown in Figure 1 to the secured position shown in Figure 2 the eccentric movement of the cross-bar 16 about the pivot shaft 15 tensions the strap end 10 around the roller 17 to tighten the strap, while when the handle member 14 reaches the secured position the tension in the strap end 10 then reacts on the tubular roller 17 to urge it towards the cross-bar 16 closing the nip 18 to grip the strap firmly.

The handle member 14 is provided with a catch pin 20 which is engageable by a hooked portion 21 of a movable catch member 22 pivotally mounted by means of a pin 23 on the body 13, to releasably secure the handle member 14 in the secured position as indicated in Figure 2. The catch member 22 may be pivoted away from the catch pin 20 to release the handle member 14,

when the tension in the strap end 10 will cause the handle member 14 to pivot towards the released position.

In order to make the engagement of the catch member 22 on the catch pin 20 more positive, a resilient washer 30 is provided on the pin 23 on each side of the catch member 22. The washers 30 each provide a resilient abutment which is engaged by the face 31 on the respective side plate 14A, 14B of the handle 14 when it is in the second position, and thus hold the handle with the catch pin 20 firmly held in or "clinched in" the hooked portion 21 of the catch member 22.

Thus if the body 13 is secured to some fixed object it can be seen that the buckle will secure and tension a strap end 10 to that object.

In the particular arrangement shown in the drawings the buckle is arranged to secure the strap end 10 to the strap end 11. For this purpose the body 13 is provided with an abutment 24 over which a suitable aperture 25 in a latch plate 26 attached to the end 11 of the strap, may be hooked as shown particularly in Figure 2. The handle member 14 is provided with a cam surface 27 on each side plate, which is arranged to engage the latch plate 26 and hold it over the abutment 24, as seen in Figure 2 when the handle member 14 is in the closed position, whereas when the handle member 14 is in the released position as shown in Figure 1 the latch plate 26 may be moved in and out of the body member 13 to hook over or be released from the abutment 24.

The strap 12 may optionally be attached as for instance at points 28 and 29 to a vehicle body or a pallet to assist in the attachment of an item of cargo to the body by the strap 12.

Thus it can be seen that the invention provides a buckle which allows for the engagement and separation of flexible securing straps without removal of the straps from their attachment to a body, for the free running of a loose end of the strap through the buckle to remove the slack and for the secure locking of the strap either to a body or to the other end of the strap.

Claims

1. A locking buckle for securing one end (10) of a flexible strap, comprising a body member (13), a handle member (14) pivotally mounted on the body member for movement between a released position and a secured position, a cross-bar (16) fixedly mounted on the handle member at a point eccentric to the point of pivoting of the handle member on the body member and a locking member (17) movably mounted on the handle member to form a nip (18) between it and the cross-bar, the

arrangement being such that with the handle member in the released position an end of a flexible strap may be looped around the cross-bar with a single thickness of strap passing through said nip and with a double thickness lying against the locking member and so that on movement of the handle member to the secured position, the strap is tensioned by the eccentric movement of the cross-bar and the tension in the double thickness of the strap urges the locking member to close said nip and grip the single thickness of the strap against the locking bar.

2. A locking buckle as claimed in Claim 1, characterised in that the body member is formed with an abutment (24) over which a latch plate (26) attached to a second end (11) of the strap or a further strap, may be hooked.

3. A locking buckle as claimed in Claim 2, characterised in that the handle member is formed with a cam surface (27) arranged to hold the latch plate on the abutment when the handle is in its secured position while allowing removal of the latch plate from the abutment when the handle is in its released position.

4. A locking buckle as claimed in Claim 1, 2 or 3, characterised in that the cross-bar is of generally rectangular cross-section with rounded edges, said nip lying along a longer face of that cross-section.

5. A locking buckle as claimed in any preceding Claim, characterised in that the locking member is in the form of a roller (17).

6. A locking buckle as claimed in any preceding Claim, characterised in that the locking member is in the form of a tubular roller loosely positioned over a pivot shaft (15) so as to be movably mounted on the handle member.

7. A locking buckle as claimed in Claim 6, characterised in that the pivot shaft also provides the pivotal mounting of the handle member on the body member.

8. A locking buckle as claimed in any preceding Claim, characterised by a catch member (22) movably mounted on the body member for movement between a locked position to engage and retain the handle member in the secure position and an unlocked position to release the handle member for movement to the release position.

9. A locking buckle as claimed in Claim 8, characterised in that the catch member is pivotally mounted on the body member by means of a pin (23).

10. A locking buckle as claimed in Claim 8 or 9, characterised in that the catch member is formed with a hooked portion adapted to hook over a catch pin (20) on the handle member to so retain it in the secured position.

11. A locking buckle as claimed in Claim 8, 9 or 10, characterised by a resilient abutment (30)

engaged by the handle member in the secured position so as to firmly hold the catch member in engagement with the handle member.

12. A locking buckle as claimed in Claim 11 as dependent upon Claim 9 or 10, characterised in that the resilient abutment comprises one or more resilient washers mounted on the pin, and the handle member is formed with one or more respective faces (31) arranged to engage such washers when the handle is in the secure position.

13. An assembly of a locking buckle as claimed in any preceding Claim together with a flexible strap.

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Fig. 1

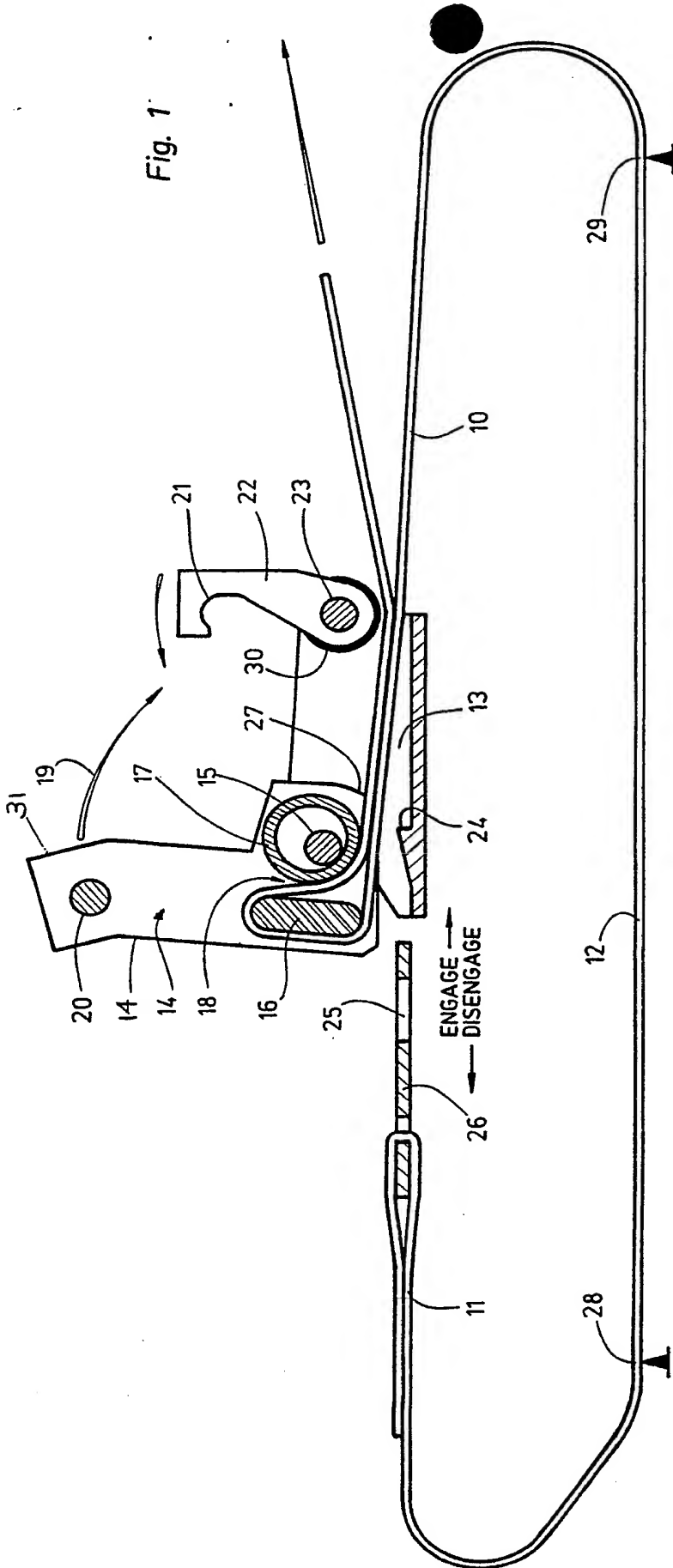
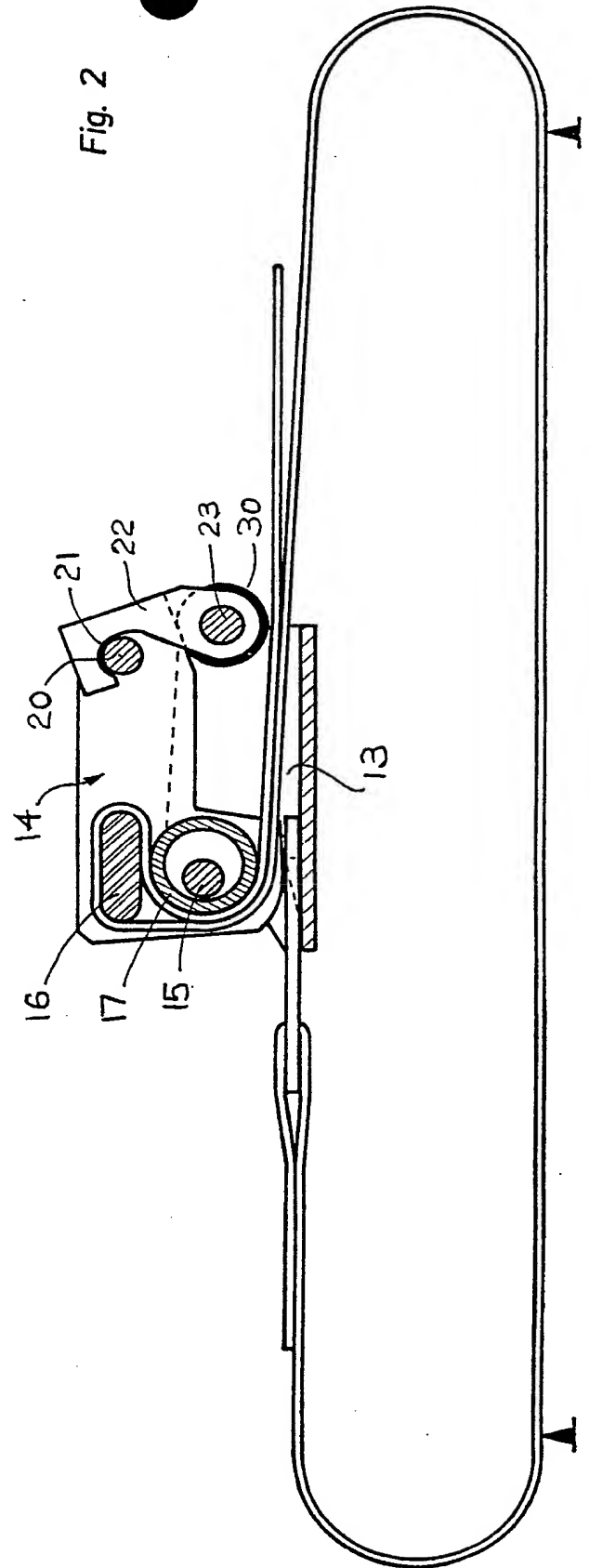


Fig. 2



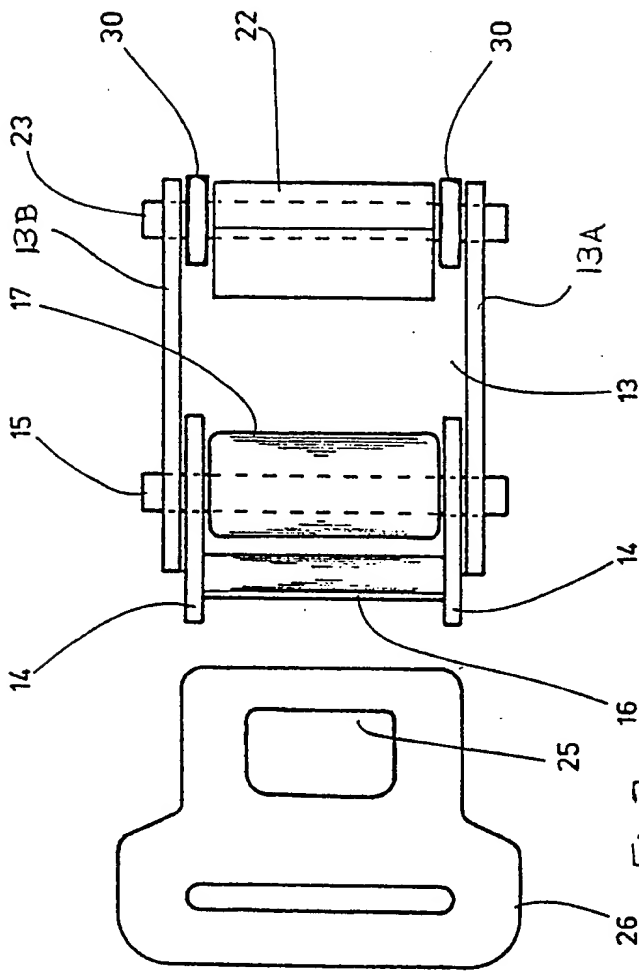


Fig. 3

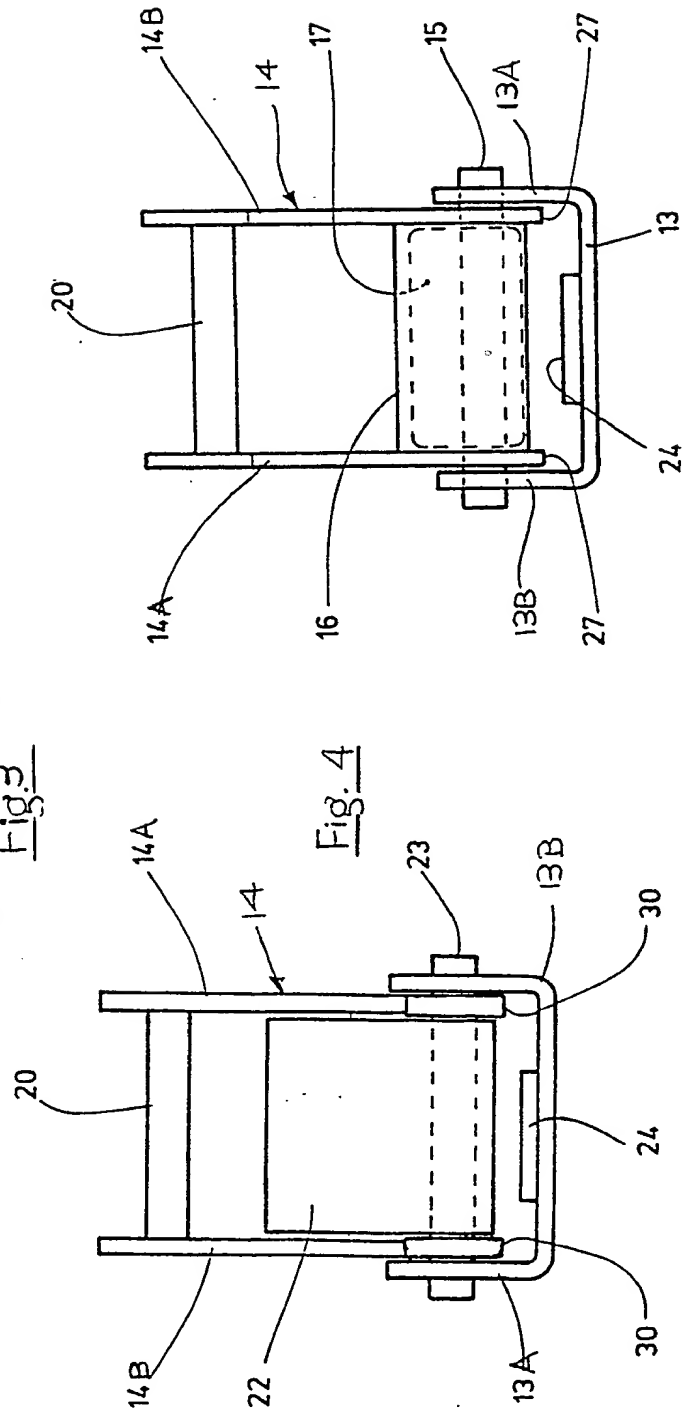


Fig. 5

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⑤④ **Improvements in or relating to buckles or securing straps.**

⑤⑦ The present invention provides a locking buckle for securing one end (10) of a flexible strap, comprising a body member (13), a handle member (14) pivotally mounted on the body member for movement between a released position and a secured position, a cross-bar (16) fixedly mounted on the handle member at a point eccentric to the point of pivoting of the handle member on the body member and a locking member (17) movably mounted on the handle member to form a nip (18) between it and the cross-bar, the arrangement being such that with the

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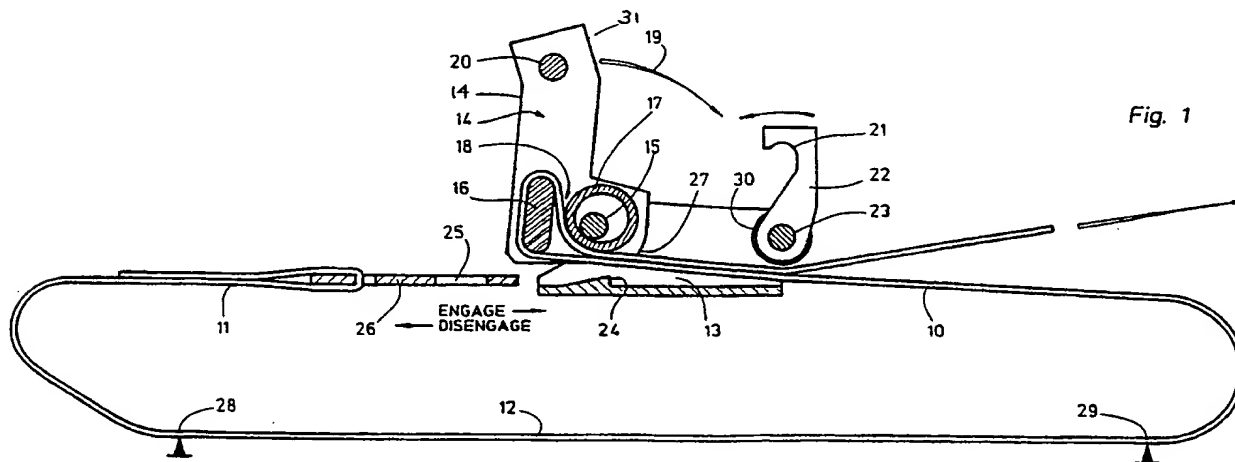


Fig. 1

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European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 31 1668

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	GB-A-914085 (EASTERN ROTORCRAFT CORPORATION) * page 2, line 67 - page 3, line 100; figures 1-5 *	1, 4, 5, 13	A44B11/12 A44B11/25
A	US-A-2972173 (C. WEBER) * column 1, line 55 - column 2, line 68; figures 1-4 *	1, 2, 5-7	
A	US-A-2904866 (A. G. CARTER) * column 2, line 51 - column 4, line 27; figures 1-4, 6, 7 *	2, 3	
A	US-A-3887966 (P. R. GLEY) * column 2, line 51 - column 3, line 50; figures 1-4 *	8-11	
A	US-A-2431819 (R. L. MEYER) * column 2, line 23 - column 3, line 9; figures 2, 3, 7 *	8, 9	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A44B B60P F16G
Place of search THE HAGUE		Date of completion of the search 12 SEPTEMBER 1990	Examiner GARNIER F.M.A.C.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document			